

## **ABSTRACT**

An array of electrodes at the atomic or nano scale (nanoelectrodes) is built on a chip. The spatial distribution, height, width and electro-chemical composition of the nanoelectrodes is varied, such that protein-specific electronic receptors are built directly on the chip with the nanoelectrodes without the use of any specific binding agents or molecules. Because of their size, a very large number of different receptors can be built as arrays on a single chip. The chip can be used to detect, characterize and quantify single molecules in solution such as individual proteins, complex protein mixtures, DNA or other molecules.

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